

Claims 1-21 (cancelled)

Claim 22 (new): A CO₂ gas seal device comprising:

means (11, 13) for sealing the CO₂ gas; and
first and second connecting hollow members (7, 9),
the connection of said first and second connecting
hollow members (7, 9) forming a connection part having a hollow
part for passing the CO₂ gas through it between said first
connecting hollow member and said second connecting hollow member
and forms a groove (19G, 17G1, 17G2, 19G1) at a gas leakage part
in the connection part,

said groove having a first part and a second part
connected to the first part and having a sectional area smaller
than that of the first part along the direction of leakage of
said CO₂ gas, the second part has a tapered surface inclined so
that its thickness becomes smaller along the direction of leakage
of said CO₂ gas,

said gas sealing means having an O-ring (11) made of
rubber arranged at the first part of said groove and one backup
ring (13) made of 46Nylon arranged at the second part of said
groove,

said backup ring having an inclined surface contacting
the tapered surface of the second part of said groove, being
enlarged in a diametrical direction at the second part of said
groove by said CO₂ gas, the deformation of said O-ring (11), and
a pressing action by the movement, and moves over the second part
of said groove,

an angle of said inclined surface of said backup ring
(13) being larger than the angle of the tapered surface of the
second part of said groove, the inclined surface of the first gas
seal member is crushed at the time of the pressing action by said

CO₂ gas to further narrow the clearance of said second part, and a front end of the second part of said groove being provided with a clearance from which said backup ring can be projected.

Claim 23 (new): The CO₂ gas seal device as set forth in claim 22, wherein said O-ring arranged at the first part of said groove and the backup ring arranged at the second part of said groove are deformed due to a pressure difference along a direction of gas leakage of said CO₂ gas.

Claim 24 (new): The connector device as set forth in claim 22, wherein:

said CO₂ gas is heated, and
said O-ring and said backup ring (11, 13) are heated by the temperature of said heated CO₂ gas and further expand and deform inside said groove.

Claim 25 (new): The CO₂ gas seal device as set forth in claim 22, wherein:

said first connecting hollow part (7) has:
a first main body (70) and
a housing (17) formed integrally with the first main body (70) and having a hollow part (73),
said second connecting hollow part (9) has
a second main body (90) and
a shaft (19) formed integrally with the second main body (90), having a hollow part (93), and having a shaft (19) having an outside diameter enabling insertion into the hollow part (73) of said housing (17),
said shaft (19) is inserted with a predetermined clearance with an inner wall of the hollow part (73) of said housing (17) so that the hollow part (93) of said shaft (19) faces the hollow part (72) of said housing (17),

a groove (19G) is formed positioned between the outer circumference of said shaft (19) and the inner wall of the hollow part (73) of said housing (17) and having a first part (19B) into which said CO₂ gas is introduced on the outer circumference of said shaft (19) or the inner wall of the hollow part (73) of said housing (17) along a direction of flow of said CO₂ gas and a second part (19T) which continues from the first part, has a smaller cross section than the cross section of said first part, and from which said pressurized gas is discharged,

said O-ring (11) is arranged at the first part of said groove contacting the outer circumference of said shaft (19) and the inner wall of the hollow part (73) of said housing (17), and

said backup ring (13) is arranged at the second part of said groove.

Claim 26 (new): The CO₂ gas seal device as set forth in claim 22, wherein:

said first connecting hollow part (7) has a first main body (70) and a housing (17) formed integrally with the first main body (70) and having a hollow part (73),

said second connecting hollow part (9) has a second main body (90) and a shaft (19) formed integrally with the second main body (90), having a hollow part (93), and having a shaft (19) having an outside diameter enabling insertion into the hollow part (73) of said housing (17),

said shaft (19) is inserted with a predetermined clearance with an inner wall of the hollow part (73) of said housing (17) so that the hollow part (93) of said shaft (19) faces the hollow part (72) of said housing (17),

said groove (19G) is defined positioned between the outer circumference of said shaft (19) and the inner wall of the hollow part (73) of said housing (17) and having a first part (19B) into which said CO₂ gas is introduced on the outer circumference of said shaft (19) or the inner wall of the hollow

part (73) of said housing (17) along a direction of flow of said CO₂ gas and a second part (19T) which continues from the first part, has a smaller cross section than the cross section of said first part, and from which said pressurized gas is discharged,

said O-ring (11) is arranged at the first part of said groove contacting the outer circumference of said shaft (19) and the inner wall of the hollow part (73) of said housing (17), and

said backup ring (13) is arranged at the second part of said groove.

Claim 27 (new): The CO₂ gas seal device as set forth in claim 26, wherein:

the second part of said groove is inclined so as to become shallower than a depth of said first part in a direction of discharge of said gas,

the angle of said inclined surface of said backup ring (13) contacting the second part of said groove is larger than the angle of the inclined surface of the second part of said groove, and the front end of the inclined surface of the first gas seal member is crushed at the time of the pressing action by said pressurized gas to further narrow the clearance of said second part.

Claim 28 (new): The CO₂ gas seal device as set forth in claim 27, wherein:

a space between the hollow part of said housing (17) and the outer circumference of said shaft (19) forms the first part of the second groove,

an end surface on the front end of said housing (17) and a clearance facing the end surface of the main body of said second connecting hollow member form the second part of said second groove, and

a sheet-shaped second seal is fit at the second part of said second groove.

Claim 29 (new): The CO₂ gas seal device as set forth in claim 27, wherein:

a second groove having a first part and a second part continuing from the first part and having a smaller cross section than that of said first part is annularly formed at the periphery of said shaft (19) along a direction of leakage of said CO₂ gas on either of the end surface of the front end of said housing (117) or the end surface of the main body of said second connecting hollow member, and

a sheet-shaped second seal member is fit at the second part of said second groove.